SEQUENCE LISTING

<110> Axxima Pharmaceuticals AG

<120> CELLULAR KINASES INVOLVED IN CYTOMEGALOVIRUS INFECTION
      AND THEIR INHIBITION

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<170> PatentIn Ver. 2.1

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ctcgctcgtg caggggcgta tctgggcgcc tgagcgcgca gtgggagcct tgggagccgc 180

cgcagcaggg ggcacacccg gaaccggcct gagcgcccgg gacc atg aac ggg gag 236
                                              Met Asn Gly Glu
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gcc atc tgc agc gcc ctg ccc acc att ccc tac cac aaa ctc gcc gac   284
Ala Ile Cys Ser Ala Leu Pro Thr Ile Pro Tyr His Lys Leu Ala Asp
  5   10   15   20

ctg cgc tac ctg agc cgc ggc gcc tct ggc act gtg tcg tcc gcc cgc   332
Leu Arg Tyr Leu Ser Arg Gly Ala Ser Gly Thr Val Ser Ser Ala Arg
                 25   30   35

cac gca gac tgg cgc gtc cag gtg gcc gtg aag cac ctg cac atc cac   380
His Ala Asp Trp Arg Val Gln Val Ala Val Lys His Leu His Ile His
                 40   45   50

act ccg ctg ctc gac agt gaa aga aag gat gtc tta aga gaa gct gaa   428
Thr Pro Leu Leu Asp Ser Glu Arg Lys Asp Val Leu Arg Glu Ala Glu
                 55   60   65

att tta cac aaa gct aga ttt agt tac att ctt cca att ttg gga att   476
Ile Leu His Lys Ala Arg Phe Ser Tyr Ile Leu Pro Ile Leu Gly Ile
          70   75   80

tgc aat gag cct gaa ttt ttg gga ata gtt act gaa tac atg cca aat   524
Cys Asn Glu Pro Glu Phe Leu Gly Ile Val Thr Glu Tyr Met Pro Asn
 85   90   95   100

gga tca tta aat gaa ctc cta cat agg aaa act gaa tat cct gat gtt   572
Gly Ser Leu Asn Glu Leu Leu His Arg Lys Thr Glu Tyr Pro Asp Val
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      gct tgg cca ttg aga ttt cgc atc ctg cat gaa att gcc ctt ggt gta     620
      Ala Trp Pro Leu Arg Phe Arg Ile Leu His Glu Ile Ala Leu Gly Val
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 5    aat tac ctg cac aat atg act cct cct tta ctt cat cat gac ttg aag     668
      Asn Tyr Leu His Asn Met Thr Pro Pro Leu Leu His His Asp Leu Lys
              135              140                  145

10    act cag aat atc tta ttg gac aat gaa ttt cat gtt aag att gca gat     716
      Thr Gln Asn Ile Leu Leu Asp Asn Glu Phe His Val Lys Ile Ala Asp
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15    ttt ggt tta tca aag tgg cgc atg atg tcc ctc tca cag tca cga agt     764
      Phe Gly Leu Ser Lys Trp Arg Met Met Ser Leu Ser Gln Ser Arg Ser
      165              170              175                  180

      agc aaa tct gca cca gaa gga ggg aca att atc tat atg cca cct gaa     812
      Ser Lys Ser Ala Pro Glu Gly Gly Thr Ile Ile Tyr Met Pro Pro Glu
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      aac tat gaa cct gga caa aaa tca agg gcc agt atc aag cac gat ata     860
      Asn Tyr Glu Pro Gly Gln Lys Ser Arg Ala Ser Ile Lys His Asp Ile
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25    tat agc tat gca gtt atc aca tgg gaa gtg tta tcc aga aaa cag cct     908
      Tyr Ser Tyr Ala Val Ile Thr Trp Glu Val Leu Ser Arg Lys Gln Pro
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30    ttt gaa gat gtc acc aat cct ttg cag ata atg tat agt gtg tca caa     956
      Phe Glu Asp Val Thr Asn Pro Leu Gln Ile Met Tyr Ser Val Ser Gln
      230              235              240

35    gga cat cga cct gtt att aat gaa gaa agt ttg cca tat gat ata cct    1004
      Gly His Arg Pro Val Ile Asn Glu Glu Ser Leu Pro Tyr Asp Ile Pro
      245              250              255                  260

      cac cga gca cgt atg atc tct cta ata gaa agt gga tgg gca caa aat    1052
      His Arg Ala Arg Met Ile Ser Leu Ile Glu Ser Gly Trp Ala Gln Asn
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      cca gat gaa aga cca tct ttc tta aaa tgt tta ata gaa ctt gaa cca    1100
      Pro Asp Glu Arg Pro Ser Phe Leu Lys Cys Leu Ile Glu Leu Glu Pro
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45    gtt ttg aga aca ttt gaa gag ata act ttt ctt gaa gct gtt att cag    1148
      Val Leu Arg Thr Phe Glu Glu Ile Thr Phe Leu Glu Ala Val Ile Gln
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50    cta aag aaa aca aag tta cag agt gtt tca agt gcc att cac cta tgt    1196
      Leu Lys Lys Thr Lys Leu Gln Ser Val Ser Ser Ala Ile His Leu Cys
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55    gac aag aag aaa atg gaa tta tct ctg aac ata cct gta aat cat ggt    1244
      Asp Lys Lys Lys Met Glu Leu Ser Leu Asn Ile Pro Val Asn His Gly
      325              330              335                  340

      cca caa gag gaa tca tgt gga tcc tct cag ctc cat gaa aat agt ggt    1292
      Pro Gln Glu Glu Ser Cys Gly Ser Ser Gln Leu His Glu Asn Ser Gly
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      tct cct gaa act tca agg tcc ctg cca gct cct caa gac aat gat ttt    1340
      Ser Pro Glu Thr Ser Arg Ser Leu Pro Ala Pro Gln Asp Asn Asp Phe
                       360              365                  370
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     Leu Ser Arg Lys Ala Gln Asp Cys Tyr Phe Met Lys Leu His His Cys
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5    cct gga aat cac agt tgg gat agc acc att tct ggt tct caa agg gct   1436
     Pro Gly Asn His Ser Trp Asp Ser Thr Ile Ser Gly Ser Gln Arg Ala
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     gca ttc tgt gat cac aag acc act cca tgc tct tca gca ata ata aat   1484
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     Pro Leu Ser Thr Ala Gly Asn Ser Glu Arg Leu Gln Pro Gly Ile Ala
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     cag cag tgg atc cag agc aaa agg gaa gac att gtg aac caa atg aca   1580
     Gln Gln Trp Ile Gln Ser Lys Arg Glu Asp Ile Val Asn Gln Met Thr
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     gaa gcc tgc ctt aac cag tcg cta gat gcc ctt ctg tcc agg gac ttg   1628
     Glu Ala Cys Leu Asn Gln Ser Leu Asp Ala Leu Leu Ser Arg Asp Leu
                 455                 460                 465

25   atc atg aaa gag gac tat gaa ctt gtt agt acc aag cct aca agg acc   1676
     Ile Met Lys Glu Asp Tyr Glu Leu Val Ser Thr Lys Pro Thr Arg Thr
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     tca aaa gtc aga caa tta cta gac act act gac atc caa gga gaa gaa   1724
30   Ser Lys Val Arg Gln Leu Leu Asp Thr Thr Asp Ile Gln Gly Glu Glu
     485                 490                 495                 500

     ttt gcc aaa gtt ata gta caa aaa ttg aaa gat aac aaa caa atg ggt   1772
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     ctt cag cct tac ccg gaa ata ctt gtg gtt tct aga tca cca tct tta   1820
     Leu Gln Pro Tyr Pro Glu Ile Leu Val Val Ser Arg Ser Pro Ser Leu
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     aat tta ctt caa aat aaa agc atg taa gtgactgttt ttcaagaaga        1867
     Asn Leu Leu Gln Asn Lys Ser Met
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     tacaaagggt tattaattta aaactccatt attaggatta cattttaaag ttttatttat 2347
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     gaattccctt taaaaatgat atttcaaagg taaacaata caatataaag aaaaaaataa 2407

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        35                  40                  45
Leu His Ile His Thr Pro Leu Leu Asp Ser Glu Arg Lys Asp Val Leu
    50                  55                  60
Arg Glu Ala Glu Ile Leu His Lys Ala Arg Phe Ser Tyr Ile Leu Pro
65                  70                  75                  80
Ile Leu Gly Ile Cys Asn Glu Pro Glu Phe Leu Gly Ile Val Thr Glu
                85                  90                  95
Tyr Met Pro Asn Gly Ser Leu Asn Glu Leu Leu His Arg Lys Thr Glu
            100                 105                 110
Tyr Pro Asp Val Ala Trp Pro Leu Arg Phe Arg Ile Leu His Glu Ile
        115                 120                 125
Ala Leu Gly Val Asn Tyr Leu His Asn Met Thr Pro Pro Leu Leu His
    130                 135                 140
His Asp Leu Lys Thr Gln Asn Ile Leu Leu Asp Asn Glu Phe His Val
145                 150                 155                 160
Lys Ile Ala Asp Phe Gly Leu Ser Lys Trp Arg Met Met Ser Leu Ser
                165                 170                 175
Gln Ser Arg Ser Ser Lys Ser Ala Pro Glu Gly Gly Thr Ile Ile Tyr
            180                 185                 190
Met Pro Pro Glu Asn Tyr Glu Pro Gly Gln Lys Ser Arg Ala Ser Ile
        195                 200                 205
Lys His Asp Ile Tyr Ser Tyr Ala Val Ile Thr Trp Glu Val Leu Ser
    210                 215                 220
Arg Lys Gln Pro Phe Glu Asp Val Thr Asn Pro Leu Gln Ile Met Tyr
225                 230                 235                 240
Ser Val Ser Gln Gly His Arg Pro Val Ile Asn Glu Glu Ser Leu Pro
                245                 250                 255
Tyr Asp Ile Pro His Arg Ala Arg Met Ile Ser Leu Ile Glu Ser Gly
            260                 265                 270
Trp Ala Gln Asn Pro Asp Glu Arg Pro Ser Phe Leu Lys Cys Leu Ile
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Glu Leu Glu Pro Val Leu Arg Thr Phe Glu Glu Ile Thr Phe Leu Glu
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Ala Val Ile Gln Leu Lys Lys Thr Lys Leu Gln Ser Val Ser Ser Ala
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Ile His Leu Cys Asp Lys Lys Lys Met Glu Leu Ser Leu Asn Ile Pro
                325                 330                 335
Val Asn His Gly Pro Gln Glu Glu Ser Cys Gly Ser Ser Gln Leu His
            340                 345                 350
Glu Asn Ser Gly Ser Pro Glu Thr Ser Arg Ser Leu Pro Ala Pro Gln
        355                 360                 365
Asp Asn Asp Phe Leu Ser Arg Lys Ala Gln Asp Cys Tyr Phe Met Lys
    370                 375                 380
Leu His His Cys Pro Gly Asn His Ser Trp Asp Ser Thr Ile Ser Gly
385                 390                 395                 400
Ser Gln Arg Ala Ala Phe Cys Asp His Lys Thr Thr Pro Cys Ser Ser
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Ala Ile Ile Asn Pro Leu Ser Thr Ala Gly Asn Ser Glu Arg Leu Gln
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    465              470              475              480
    Pro Thr Arg Thr Ser Lys Val Arg Gln Leu Leu Asp Thr Thr Asp Ile
                     485              490              495
    Gln Gly Glu Glu Phe Ala Lys Val Ile Val Gln Lys Leu Lys Asp Asn
                500              505              510
    Lys Gln Met Gly Leu Gln Pro Tyr Pro Glu Ile Leu Val Val Ser Arg
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SEQUENCE LISTING

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<120> CELLULAR KINASES INVOLVED IN CYTOMEGALOVIRUS INFECTION
      AND THEIR INHIBITION

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ttc ctg gag agt gca gaa ctg gac agc gga ggc ttt ggg aag gtg tct      96
Phe Leu Glu Ser Ala Glu Leu Asp Ser Gly Gly Phe Gly Lys Val Ser
             20                  25                  30

ctg tgt ttc cac aga acc cag gga ctc atg atc atg aaa aca gtg tac     144
Leu Cys Phe His Arg Thr Gln Gly Leu Met Ile Met Lys Thr Val Tyr
             35                  40                  45

aag ggg ccc aac tgc att gag cac aac gag gcc ctc ttg gag gag gcg     192
Lys Gly Pro Asn Cys Ile Glu His Asn Glu Ala Leu Leu Glu Glu Ala
         50                  55                  60

aag atg atg aac aga ctg aga cac agc cgg gtg gtg aag ctc ctg ggc     240
Lys Met Met Asn Arg Leu Arg His Ser Arg Val Val Lys Leu Leu Gly
 65                  70                  75                  80

gtc atc ata gag gaa ggg aag tac tcc ctg gtg atg gag tac atg gag     288
Val Ile Ile Glu Glu Gly Lys Tyr Ser Leu Val Met Glu Tyr Met Glu
                 85                  90                  95
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     aag ggc aac ctg atg cac gtg ctg aaa gcc gag atg agt act ccg ctt   336
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 5   tct gta aaa gga agg ata att ttg gaa atc att gaa gga atg tgc tac   384
     Ser Val Lys Gly Arg Ile Ile Leu Glu Ile Ile Glu Gly Met Cys Tyr
                 115             120             125

     tta cat gga aaa ggc gtg ata cac aag gac ctg aag cct gaa aat atc   432
10   Leu His Gly Lys Gly Val Ile His Lys Asp Leu Lys Pro Glu Asn Ile
                 130             135             140

     ctt gtt gat aat gac ttc cac att aag atc gca gac ctc ggc ctt gcc   480
     Leu Val Asp Asn Asp Phe His Ile Lys Ile Ala Asp Leu Gly Leu Ala
15   145             150             155             160

     tcc ttt aag atg tgg agc aaa ctg aat aat gaa gag cac aat gag ctg   528
     Ser Phe Lys Met Trp Ser Lys Leu Asn Asn Glu Glu His Asn Glu Leu
                 165             170             175
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     agg gaa gtg gac ggc acc gct aag aag aat ggc ggc acc ctc tac tac   576
     Arg Glu Val Asp Gly Thr Ala Lys Lys Asn Gly Gly Thr Leu Tyr Tyr
                 180             185             190

25   atg gcg ccc gag cac ctg aat gac gtc aac gca aag ccc aca gag aag   624
     Met Ala Pro Glu His Leu Asn Asp Val Asn Ala Lys Pro Thr Glu Lys
                 195             200             205

     tcg gat gtg tac agc ttt gct gta gta ctc tgg gcg ata ttt gca aat   672
30   Ser Asp Val Tyr Ser Phe Ala Val Val Leu Trp Ala Ile Phe Ala Asn
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     aag gag cca tat gaa aat gct atc tgt gag cag cag ttg ata atg tgc   720
     Lys Glu Pro Tyr Glu Asn Ala Ile Cys Glu Gln Gln Leu Ile Met Cys
35   225             230             235             240

     ata aaa tct ggg aac agg cca gat gtg gat gac atc act gag tac tgc   768
     Ile Lys Ser Gly Asn Arg Pro Asp Val Asp Asp Ile Thr Glu Tyr Cys
                 245             250             255
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     cca aga gaa att atc agt ctc atg aag ctc tgc tgg gaa gcg aat ccg   816
     Pro Arg Glu Ile Ile Ser Leu Met Lys Leu Cys Trp Glu Ala Asn Pro
                 260             265             270

45   gaa gct cgg ccg aca ttt cct ggc att gaa gaa aaa ttt agg cct ttt   864
     Glu Ala Arg Pro Thr Phe Pro Gly Ile Glu Glu Lys Phe Arg Pro Phe
                 275             280             285

     tat tta agt caa tta gaa gaa agt gta gaa gag gac gtg aag agt tta   912
50   Tyr Leu Ser Gln Leu Glu Glu Ser Val Glu Glu Asp Val Lys Ser Leu
                 290             295             300

     aag aaa gag tat tca aac gaa aat gca gtt gtg aag aga atg cag tct   960
     Lys Lys Glu Tyr Ser Asn Glu Asn Ala Val Val Lys Arg Met Gln Ser
55   305             310             315             320

     ctt caa ctt gat tgt gtg gca gta cct tca agc cgg tca aat tca gcc   1008
     Leu Gln Leu Asp Cys Val Ala Val Pro Ser Ser Arg Ser Asn Ser Ala
                 325             330             335
60
     aca gaa cag cct ggt tca ctg cac agt tcc cag gga ctt ggg atg ggt   1056
     Thr Glu Gln Pro Gly Ser Leu His Ser Ser Gln Gly Leu Gly Met Gly
                 340             345             350
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cct gtg gag gag tcc tgg ttt gct cct tcc ctg gag cac cca caa gaa   1104
Pro Val Glu Glu Ser Trp Phe Ala Pro Ser Leu Glu His Pro Gln Glu
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gag aat gag ccc agc ctg cag agt aaa ctc caa gac gaa gcc aac tac   1152
Glu Asn Glu Pro Ser Leu Gln Ser Lys Leu Gln Asp Glu Ala Asn Tyr
        370                 375                 380

cat ctt tat ggc agc cgc atg gac agg cag acg aaa cag cag ccc aga   1200
His Leu Tyr Gly Ser Arg Met Asp Arg Gln Thr Lys Gln Gln Pro Arg
385                 390                 395                 400

cag aat gtg gct tac aac aga gag gag gaa agg aga cgc agg gtc tcc   1248
Gln Asn Val Ala Tyr Asn Arg Glu Glu Glu Arg Arg Arg Arg Val Ser
                405                 410                 415

cat gac cct ttt gca cag caa aga cct tac gag aat ttt cag aat aca   1296
His Asp Pro Phe Ala Gln Gln Arg Pro Tyr Glu Asn Phe Gln Asn Thr
                420                 425                 430

gag gga aaa ggc act gtt tat tcc agt gca gcc agt cat ggt aat gca   1344
Glu Gly Lys Gly Thr Val Tyr Ser Ser Ala Ala Ser His Gly Asn Ala
            435                 440                 445

gtg cac cag ccc tca ggg ctc acc agc caa cct caa gta ctg tat cag   1392
Val His Gln Pro Ser Gly Leu Thr Ser Gln Pro Gln Val Leu Tyr Gln
        450                 455                 460

aac aat gga tta tat agc tca cat ggc ttt gga aca aga cca ctg gat   1440
Asn Asn Gly Leu Tyr Ser Ser His Gly Phe Gly Thr Arg Pro Leu Asp
465                 470                 475                 480

cca gga aca gca ggt ccc aga gtt tgg tac agg cca att cca agt cat   1488
Pro Gly Thr Ala Gly Pro Arg Val Trp Tyr Arg Pro Ile Pro Ser His
                485                 490                 495

atg cct agt ctg cat aat atc cca gtg cct gag acc aac tat cta gga   1536
Met Pro Ser Leu His Asn Ile Pro Val Pro Glu Thr Asn Tyr Leu Gly
            500                 505                 510

aat aca ccc acc atg cca ttc agc tcc ttg cca cca aca gat gaa tct   1584
Asn Thr Pro Thr Met Pro Phe Ser Ser Leu Pro Pro Thr Asp Glu Ser
            515                 520                 525

ata aaa tat acc ata tac aat agt act ggc att cag att gga gcc tac   1632
Ile Lys Tyr Thr Ile Tyr Asn Ser Thr Gly Ile Gln Ile Gly Ala Tyr
        530                 535                 540

aat tat atg gag att ggt ggg acg agt tca tca cta cta gac agc aca   1680
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545                 550                 555                 560

aat acg aac ttc aaa gaa gag cca gct gct aag tac caa gct atc ttt   1728
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gat aat acc act agt ctg acg gat aaa cac ctg gac cca atc agg gaa   1776
Asp Asn Thr Thr Ser Leu Thr Asp Lys His Leu Asp Pro Ile Arg Glu
                580                 585                 590

aat ctg gga aag cac tgg aaa aac tgt gcc cgt aaa ctg ggc ttc aca   1824
Asn Leu Gly Lys His Trp Lys Asn Cys Ala Arg Lys Leu Gly Phe Thr
        595                 600                 605
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cag tct cag att gat gaa att gac cat gac tat gag cga gat gga ctg   1872
Gln Ser Gln Ile Asp Glu Ile Asp His Asp Tyr Glu Arg Asp Gly Leu
    610             615             620

aaa gaa aag gtt tac cag atg ctc caa aag tgg gtg atg agg gaa ggc   1920
Lys Glu Lys Val Tyr Gln Met Leu Gln Lys Trp Val Met Arg Glu Gly
625             630             635             640

ata aag gga gcc acg gtg ggg aag ctg gcc cag gcg ctc cac cag tgt   1968
Ile Lys Gly Ala Thr Val Gly Lys Leu Ala Gln Ala Leu His Gln Cys
                645             650             655

tcc agg atc gac ctt ctg agc agc ttg att tac gtc agc cag aac taa   2016
Ser Arg Ile Asp Leu Leu Ser Ser Leu Ile Tyr Val Ser Gln Asn
            660             665             670

ccctggatgg gctacggcag ctgaagtgga cgcctcactt agcggataac cccagaaagt 2076

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Leu Cys Phe His Arg Thr Gln Gly Leu Met Ile Met Lys Thr Val Tyr
        35              40              45
Lys Gly Pro Asn Cys Ile Glu His Asn Glu Ala Leu Leu Glu Glu Ala
        50              55              60
Lys Met Met Asn Arg Leu Arg His Ser Arg Val Val Lys Leu Leu Gly
65              70              75              80
Val Ile Ile Glu Glu Gly Lys Tyr Ser Leu Val Met Glu Tyr Met Glu
                85              90              95
Lys Gly Asn Leu Met His Val Leu Lys Ala Glu Met Ser Thr Pro Leu
            100             105             110
Ser Val Lys Gly Arg Ile Ile Leu Glu Ile Ile Glu Gly Met Cys Tyr
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Leu His Gly Lys Gly Val Ile His Lys Asp Leu Lys Pro Glu Asn Ile
    130             135             140
Leu Val Asp Asn Asp Phe His Ile Lys Ile Ala Asp Leu Gly Leu Ala
145             150             155             160
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     Arg Glu Val Asp Gly Thr Ala Lys Lys Asn Gly Gly Thr Leu Tyr Tyr
                 180                 185                 190
 5   Met Ala Pro Glu His Leu Asn Asp Val Asn Ala Lys Pro Thr Glu Lys
                 195                 200                 205
     Ser Asp Val Tyr Ser Phe Ala Val Val Leu Trp Ala Ile Phe Ala Asn
         210                 215                 220
     Lys Glu Pro Tyr Glu Asn Ala Ile Cys Glu Gln Gln Leu Ile Met Cys
10   225                 230                 235                 240
     Ile Lys Ser Gly Asn Arg Pro Asp Val Asp Asp Ile Thr Glu Tyr Cys
                     245                 250                 255
     Pro Arg Glu Ile Ile Ser Leu Met Lys Leu Cys Trp Glu Ala Asn Pro
                 260                 265                 270
15   Glu Ala Arg Pro Thr Phe Pro Gly Ile Glu Glu Lys Phe Arg Pro Phe
                 275                 280                 285
     Tyr Leu Ser Gln Leu Glu Glu Ser Val Glu Glu Asp Val Lys Ser Leu
         290                 295                 300
     Lys Lys Glu Tyr Ser Asn Glu Asn Ala Val Val Lys Arg Met Gln Ser
20   305                 310                 315                 320
     Leu Gln Leu Asp Cys Val Ala Val Pro Ser Ser Arg Ser Asn Ser Ala
                     325                 330                 335
     Thr Glu Gln Pro Gly Ser Leu His Ser Ser Gln Gly Leu Gly Met Gly
                 340                 345                 350
25   Pro Val Glu Glu Ser Trp Phe Ala Pro Ser Leu Glu His Pro Gln Glu
                 355                 360                 365
     Glu Asn Glu Pro Ser Leu Gln Ser Lys Leu Gln Asp Glu Ala Asn Tyr
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     His Leu Tyr Gly Ser Arg Met Asp Arg Gln Thr Lys Gln Gln Pro Arg
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     Gln Asn Val Ala Tyr Asn Arg Glu Glu Glu Arg Arg Arg Arg Val Ser
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     His Asp Pro Phe Ala Gln Gln Arg Pro Tyr Glu Asn Phe Gln Asn Thr
                 420                 425                 430
35   Glu Gly Lys Gly Thr Val Tyr Ser Ser Ala Ala Ser His Gly Asn Ala
                 435                 440                 445
     Val His Gln Pro Ser Gly Leu Thr Ser Gln Pro Gln Val Leu Tyr Gln
         450                 455                 460
     Asn Asn Gly Leu Tyr Ser Ser His Gly Phe Gly Thr Arg Pro Leu Asp
40   465                 470                 475                 480
     Pro Gly Thr Ala Gly Pro Arg Val Trp Tyr Arg Pro Ile Pro Ser His
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     Met Pro Ser Leu His Asn Ile Pro Val Pro Glu Thr Asn Tyr Leu Gly
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45   Asn Thr Pro Thr Met Pro Phe Ser Ser Leu Pro Pro Thr Asp Glu Ser
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     Ile Lys Tyr Thr Ile Tyr Asn Ser Thr Gly Ile Gln Ile Gly Ala Tyr
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     Asn Tyr Met Glu Ile Gly Gly Thr Ser Ser Ser Leu Leu Asp Ser Thr
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     Gln Ser Gln Ile Asp Glu Ile Asp His Asp Tyr Glu Arg Asp Gly Leu
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     Lys Glu Lys Val Tyr Gln Met Leu Gln Lys Trp Val Met Arg Glu Gly
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AND THEIR INHIBITION

<130> Y10256

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Val Met Glu Met Ala Cys Pro Gly Ala Pro Gly Ser Ala Val Gly Gln
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Gln Lys Glu Leu Pro Lys Pro Lys Glu Lys Thr Pro Pro Leu Gly Lys
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Lys Gln Ser Ser Val Tyr Lys Leu Glu Ala Val Glu Lys Ser Pro Val
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ttc tgc gga aag tgg gag atc ctg aat gac gtg att acc aag ggc aca 430
Phe Cys Gly Lys Trp Glu Ile Leu Asn Asp Val Ile Thr Lys Gly Thr
                  55   60   65

gcc aag gaa ggc tcc gag gca ggg cca gct gcc atc tct atc atc gcc 478
Ala Lys Glu Gly Ser Glu Ala Gly Pro Ala Ala Ile Ser Ile Ile Ala
                  70   75   80

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Gln Ala Glu Cys Glu Asn Ser Gln Glu Phe Ser Pro Thr Phe Ser Glu
              85   90   95

cgc att ttc atc gct ggg tcc aaa cag tac agc cag tcc gag agt ctt 574
Arg Ile Phe Ile Ala Gly Ser Lys Gln Tyr Ser Gln Ser Glu Ser Leu
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gat cag atc ccc aac aat gtg gcc cat gct aca gag ggc aaa atg gcc   622
Asp Gln Ile Pro Asn Asn Val Ala His Ala Thr Glu Gly Lys Met Ala
115             120             125             130

cgt gtg tgt tgg aag gga aag cgt cgc agc aaa gcc cgg aag aaa cgg   670
Arg Val Cys Trp Lys Gly Lys Arg Arg Ser Lys Ala Arg Lys Lys Arg
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aag aag aag agc tca aag tcc ctg gct cat gca gga gtg gcc ttg gcc   718
Lys Lys Lys Ser Ser Lys Ser Leu Ala His Ala Gly Val Ala Leu Ala
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aaa ccc ctc ccc agg acc cct gag cag gag agc tgc acc atc cca gtg   766
Lys Pro Leu Pro Arg Thr Pro Glu Gln Glu Ser Cys Thr Ile Pro Val
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cag gag gat gag tct cca ctc ggc gcc cca tat gtt aga aac acc ccg   814
Gln Glu Asp Glu Ser Pro Leu Gly Ala Pro Tyr Val Arg Asn Thr Pro
    180             185             190

cag ttc acc aag cct ctg aag gaa cca ggc ctt ggg caa ctc tgt ttt   862
Gln Phe Thr Lys Pro Leu Lys Glu Pro Gly Leu Gly Gln Leu Cys Phe
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aag cag ctt ggc gag ggc cta cgg ccg gct ctg cct cga tca gaa ctc   910
Lys Gln Leu Gly Glu Gly Leu Arg Pro Ala Leu Pro Arg Ser Glu Leu
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cac aaa ctg atc agc ccc ttg caa tgt ctg aac cac gtg tgg aaa ctg   958
His Lys Leu Ile Ser Pro Leu Gln Cys Leu Asn His Val Trp Lys Leu
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cac cac ccc cag gac gga ggc ccc ctg ccc ctg ccc acg cac ccc ttc  1006
His His Pro Gln Asp Gly Gly Pro Leu Pro Leu Pro Thr His Pro Phe
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ccc tat agc aga ctg cct cat ccc ttc cca ttc cac cct ctc cag ccc  1054
Pro Tyr Ser Arg Leu Pro His Pro Phe Pro Phe His Pro Leu Gln Pro
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tgg aaa cct cac cct ctg gag tcc ttc ctg ggc aaa ctg gcc tgt gta  1102
Trp Lys Pro His Pro Leu Glu Ser Phe Leu Gly Lys Leu Ala Cys Val
275             280             285             290

gac agc cag aaa ccc ttg cct gac cca cac ctg agc aaa ctg gcc tgt  1150
Asp Ser Gln Lys Pro Leu Pro Asp Pro His Leu Ser Lys Leu Ala Cys
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gta gac agt cca aag ccc ctg cct ggc cca cac ctg gag ccc agc tgc  1198
Val Asp Ser Pro Lys Pro Leu Pro Gly Pro His Leu Glu Pro Ser Cys
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ctg tct cgt ggt gcc cat gag aag ttt tct gtg gag gaa tac cta gtg  1246
Leu Ser Arg Gly Ala His Glu Lys Phe Ser Val Glu Glu Tyr Leu Val
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cat gct ctg caa ggc agc gtg agc tca agc cag gcc cac agc ctg acc  1294
His Ala Leu Gln Gly Ser Val Ser Ser Ser Gln Ala His Ser Leu Thr
    340             345             350

agc ctg gcc aag acc tgg gca gca cgg ggc tcc aga tcc cgg gag ccc  1342
Ser Leu Ala Lys Thr Trp Ala Ala Arg Gly Ser Arg Ser Arg Glu Pro
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Ser Pro Lys Thr Glu Asp Asn Glu Gly Val Leu Leu Thr Glu Lys Leu
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aag cca gtg gat tat gag tac cga gaa gaa gtc cac tgg gcc acg cac    1438
Lys Pro Val Asp Tyr Glu Tyr Arg Glu Glu Val His Trp Ala Thr His
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cag ctc cgc ctg ggc aga ggc tcc ttc gga gag gtg cac agg atg gag    1486
Gln Leu Arg Leu Gly Arg Gly Ser Phe Gly Glu Val His Arg Met Glu
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gac aag cag act ggc ttc cag tgc gct gtc aaa aag gtg cgg ctg gaa    1534
Asp Lys Gln Thr Gly Phe Gln Cys Ala Val Lys Lys Val Arg Leu Glu
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Val Phe Arg Ala Glu Glu Leu Met Ala Cys Ala Gly Leu Thr Ser Pro
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aga att gtc cct ttg tat gga gct gtg aga gaa ggg cct tgg gtc aac    1630
Arg Ile Val Pro Leu Tyr Gly Ala Val Arg Glu Gly Pro Trp Val Asn
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atc ttc atg gag ctg ctg gaa ggt ggc tcc ctg ggc cag ctg gtc aag    1678
Ile Phe Met Glu Leu Leu Glu Gly Gly Ser Leu Gly Gln Leu Val Lys
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gag cag ggc tgt ctc cca gag gac cgg gcc ctg tac tac ctg ggc cag    1726
Glu Gln Gly Cys Leu Pro Glu Asp Arg Ala Leu Tyr Tyr Leu Gly Gln
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gcc ctg gag ggt ctg gaa tac ctc cac tca cga agg att ctg cat ggg    1774
Ala Leu Glu Gly Leu Glu Tyr Leu His Ser Arg Arg Ile Leu His Gly
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Asp Val Lys Ala Asp Asn Val Leu Leu Ser Ser Asp Gly Ser His Ala
515             520             525             530

gcc ctc tgt gac ttt ggc cat gct gtg tgt ctt caa cct gat ggc ctg    1870
Ala Leu Cys Asp Phe Gly His Ala Val Cys Leu Gln Pro Asp Gly Leu
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gga aag tcc ttg ctc aca ggg gac tac atc cct ggc aca gag acc cac    1918
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Met Ala Pro Glu Val Val Leu Gly Arg Ser Cys Asp Ala Lys Val Asp
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Val Trp Ser Ser Cys Cys Met Met Leu His Met Leu Asn Gly Cys His
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gag cct ccg cct gtg agg gag atc cca ccc tcc tgc gcc cct ctc aca    2110
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     tct gca gcg gag ctg gga ggg aag gtg aac cgg gca cta cag caa gtg   2206
     Ser Ala Ala Glu Leu Gly Gly Lys Val Asn Arg Ala Leu Gln Gln Val
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10   gga ggt ctg aag agc cct tgg agg gga gaa tat aaa gaa cca aga cat   2254
     Gly Gly Leu Lys Ser Pro Trp Arg Gly Glu Tyr Lys Glu Pro Arg His
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     Thr Gly Arg Ala Pro Lys Leu Gln Pro Pro Leu Pro Pro Glu Pro Pro
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     Met Trp Glu Pro Leu Pro Leu Ser Ser Leu Glu Pro Ala Pro Ala Arg
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     aac ccc agc tca cca gag cgg aaa gca acc gtc ccg gag cag gaa ctg   2542
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     tct ctg gag gag cag gag caa att ctc tcg tgc ctc agc atc gac agc   2638
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     tct ctt aat ggt gaa cac ctg cac atc cgg gag ttc cac cgg gtc aaa   2878
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    ttc agc ttg gtc acc aaa gac ggg cag cct gtt cgc tac gac atg gag   2974
    Phe Ser Leu Val Thr Lys Asp Gly Gln Pro Val Arg Tyr Asp Met Glu
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    agc ttc gcc tgg agc tgg agg gtc aag cat ggc cag ctg gag aac agg   3070
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Gly Lys Lys Gln Ser Ser Val Tyr Lys Leu Glu Ala Val Glu Lys Ser
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Cys Phe Lys Gln Leu Gly Glu Gly Leu Arg Pro Ala Leu Pro Arg Ser
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Glu Leu His Lys Leu Ile Ser Pro Leu Gln Cys Leu Asn His Val Trp
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Lys Leu His His Pro Gln Asp Gly Gly Pro Leu Pro Leu Pro Thr His
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Pro Phe Pro Tyr Ser Arg Leu Pro His Pro Phe Pro Phe His Pro Leu
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Gln Pro Trp Lys Pro His Pro Leu Glu Ser Phe Leu Gly Lys Leu Ala
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Cys Val Asp Ser Gln Lys Pro Leu Pro Asp Pro His Leu Ser Lys Leu
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Ala Cys Val Asp Ser Pro Lys Pro Leu Pro Gly Pro His Leu Glu Pro
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Ser Cys Leu Ser Arg Gly Ala His Glu Lys Phe Ser Val Glu Glu Tyr
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     Gly Arg Pro Thr Asp Thr Pro Ser Tyr Phe Asn Gly Val Lys Val Gln
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     Ile Gln Ser Leu Asn Gly Glu His Leu His Ile Arg Glu Phe His Arg
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Pro·Asn Pro Thr Pro Pro Arg Asn Leu Asp Ser Arg Thr Phe Ile Thr
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att gga gac aga aac ttt gag gtg gag gct gat gac ttg gtg acc atc 451
Ile Gly Asp Arg Asn Phe Glu Val Glu Ala Asp Asp Leu Val Thr Ile
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tca gaa ctg ggc cgt gga gcc tat ggg gtg gta gag aag gtg cgg cac 499
Ser Glu Leu Gly Arg Gly Ala Tyr Gly Val Val Glu Lys Val Arg His
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gcc cag agc ggc acc atc atg gcc gtg aag cgg atc cgg gcc acc gtg 547
Ala Gln Ser Gly Thr Ile Met Ala Val Lys Arg Ile Arg Ala Thr Val
55                  60              65                  70
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Asn Ser Gln Glu Gln Lys Arg Leu Leu Met Asp Leu Asp Ile Asn Met
            75                  80                  85

cgc acg gtc gac tgt ttc tac act gtc acc ttc tac ggg gca cta ttc    643
Arg Thr Val Asp Cys Phe Tyr Thr Val Thr Phe Tyr Gly Ala Leu Phe
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Arg Glu Gly Asp Val Trp Ile Cys Met Glu Leu Met Asp Thr Ser Leu
            105                 110                 115

gac aag ttc tac cgg aag gtg ctg gat aaa aac atg aca att cca gag    739
Asp Lys Phe Tyr Arg Lys Val Leu Asp Lys Asn Met Thr Ile Pro Glu
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gac atc ctt ggg gag att gct gtg tct atc gtg cgg gcc ctg gag cat    787
Asp Ile Leu Gly Glu Ile Ala Val Ser Ile Val Arg Ala Leu Glu His
135                 140                 145                 150

ctg cac agc aag ctg tcg gtg atc cac aga gat gtg aag ccc tcc aat    835
Leu His Ser Lys Leu Ser Val Ile His Arg Asp Val Lys Pro Ser Asn
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gtc ctt atc aac aag gag ggc cat gtg aag atg tgt gac ttt ggc atc    883
Val Leu Ile Asn Lys Glu Gly His Val Lys Met Cys Asp Phe Gly Ile
                170                 175                 180

agt ggc tac ttg gtg gac tct gtg gcc aag acg atg gat gcc ggc tgc    931
Ser Gly Tyr Leu Val Asp Ser Val Ala Lys Thr Met Asp Ala Gly Cys
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aag ccc tac atg gcc cct gag agg atc aac cca gag ctg aac cag aag    979
Lys Pro Tyr Met Ala Pro Glu Arg Ile Asn Pro Glu Leu Asn Gln Lys
        200                 205                 210

ggc tac aat gtc aag tcc gac gtc tgg agc ctg ggc atc acc atg att   1027
Gly Tyr Asn Val Lys Ser Asp Val Trp Ser Leu Gly Ile Thr Met Ile
215                 220                 225                 230

gag atg gcc atc ctg cgg ttc cct tac gag tcc tgg ggg acc ccg ttc   1075
Glu Met Ala Ile Leu Arg Phe Pro Tyr Glu Ser Trp Gly Thr Pro Phe
                235                 240                 245

cag cag ctg aag cag gtg gtg gag gag ccg tcc ccc cag ctc cca gcc   1123
Gln Gln Leu Lys Gln Val Val Glu Glu Pro Ser Pro Gln Leu Pro Ala
            250                 255                 260

gac cgt ttc tcc ccc gag ttt gtg gac ttc act gct cag tgc ctg agg   1171
Asp Arg Phe Ser Pro Glu Phe Val Asp Phe Thr Ala Gln Cys Leu Arg
        265                 270                 275

aag aac ccc gca gag cgt atg agc tac ctg gag ctg atg gag cac ccc   1219
Lys Asn Pro Ala Glu Arg Met Ser Tyr Leu Glu Leu Met Glu His Pro
        280                 285                 290

ttc ttc acc ttg cac aaa acc aag aag acg gac att gct gcc ttc gtg   1267
Phe Phe Thr Leu His Lys Thr Lys Lys Thr Asp Ile Ala Ala Phe Val
295                 300                 305                 310

aag aag atc ctg gga gaa gac tca tag gggctgggcc tcggacccca         1314
Lys Lys Ile Leu Gly Glu Asp Ser
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Asp Asp Leu Val Thr Ile Ser Glu Leu Gly Arg Gly Ala Tyr Gly Val
            35                  40                  45
Val Glu Lys Val Arg His Ala Gln Ser Gly Thr Ile Met Ala Val Lys
        50                  55                  60
Arg Ile Arg Ala Thr Val Asn Ser Gln Glu Gln Lys Arg Leu Leu Met
65                  70                  75                  80
Asp Leu Asp Ile Asn Met Arg Thr Val Asp Cys Phe Tyr Thr Val Thr
                85                  90                  95
Phe Tyr Gly Ala Leu Phe Arg Glu Gly Asp Val Trp Ile Cys Met Glu
            100                 105                 110
Leu Met Asp Thr Ser Leu Asp Lys Phe Tyr Arg Lys Val Leu Asp Lys
        115                 120                 125
Asn Met Thr Ile Pro Glu Asp Ile Leu Gly Glu Ile Ala Val Ser Ile
    130                 135                 140
Val Arg Ala Leu Glu His Leu His Ser Lys Leu Ser Val Ile His Arg
145                 150                 155                 160
Asp Val Lys Pro Ser Asn Val Leu Ile Asn Lys Glu Gly His Val Lys
                165                 170                 175
Met Cys Asp Phe Gly Ile Ser Gly Tyr Leu Val Asp Ser Val Ala Lys
            180                 185                 190
Thr Met Asp Ala Gly Cys Lys Pro Tyr Met Ala Pro Glu Arg Ile Asn
        195                 200                 205
Pro Glu Leu Asn Gln Lys Gly Tyr Asn Val Lys Ser Asp Val Trp Ser
    210                 215                 220
Leu Gly Ile Thr Met Ile Glu Met Ala Ile Leu Arg Phe Pro Tyr Glu
225                 230                 235                 240
Ser Trp Gly Thr Pro Phe Gln Gln Leu Lys Gln Val Val Glu Glu Pro
                245                 250                 255
Ser Pro Gln Leu Pro Ala Asp Arg Phe Ser Pro Glu Phe Val Asp Phe
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      Thr Ala Gln Cys Leu Arg Lys Asn Pro Ala Glu Arg Met Ser Tyr Leu
                    275                    280                    285
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        Met Ser Val Asn Ser Glu Lys Ser Ser Ser Ser Glu Arg Pro
         1               5                  10

gag cct caa cag aaa gct cct tta gtt cct cct cct cca ccg cca cca    277
Glu Pro Gln Gln Lys Ala Pro Leu Val Pro Pro Pro Pro Pro Pro Pro
 15              20                  25                      30

cca cca cca ccg cca cct ttg cca gac ccc aca ccc ccg gag cca gag    325
Pro Pro Pro Pro Pro Pro Leu Pro Asp Pro Thr Pro Pro Glu Pro Glu
                35                  40                      45

gag gag atc ctg gga tca gat gat gag gag caa gag gac cct gcg gac    373
Glu Glu Ile Leu Gly Ser Asp Asp Glu Glu Gln Glu Asp Pro Ala Asp
                50                  55                      60

tac tgc aaa ggt gga tat cat cca gtg aaa att gga gac ctc ttc aat    421
Tyr Cys Lys Gly Gly Tyr His Pro Val Lys Ile Gly Asp Leu Phe Asn
            65                  70                      75

ggc cgg tat cat gtt att aga aag ctt gga tgg ggg cac ttc tct act    469
Gly Arg Tyr His Val Ile Arg Lys Leu Gly Trp Gly His Phe Ser Thr
         80                  85                      90
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         gtc tgg ctg tgc tgg gat atg cag ggg aaa aga ttt gtt gca atg aaa    517
         Val Trp Leu Cys Trp Asp Met Gln Gly Lys Arg Phe Val Ala Met Lys
5         95              100             105             110

         gtt gta aaa agt gcc cag cat tat acg gag aca gcc ttg gat gaa ata    565
         Val Val Lys Ser Ala Gln His Tyr Thr Glu Thr Ala Leu Asp Glu Ile
                     115             120             125

10       aaa ttg ctc aaa tgt gtt cga gaa agt gat ccc agt gac cca aac aaa    613
         Lys Leu Leu Lys Cys Val Arg Glu Ser Asp Pro Ser Asp Pro Asn Lys
                     130             135             140

15       gac atg gtg gtc cag ctc att gac gac ttc aag att tca ggc atg aat    661
         Asp Met Val Val Gln Leu Ile Asp Asp Phe Lys Ile Ser Gly Met Asn
                     145             150             155

         ggg ata cat gtc tgc atg gtc ttc gaa gta ctt ggc cac cat ctc ctc    709
20       Gly Ile His Val Cys Met Val Phe Glu Val Leu Gly His His Leu Leu
             160             165             170

         aag tgg atc atc aaa tcc aac tat caa ggc ctc cca gta cgt tgt gtg    757
25       Lys Trp Ile Ile Lys Ser Asn Tyr Gln Gly Leu Pro Val Arg Cys Val
         175             180             185             190

         aag agt atc att cga cag gtc ctt caa ggg tta gat tac tta cac agt    805
         Lys Ser Ile Ile Arg Gln Val Leu Gln Gly Leu Asp Tyr Leu His Ser
                     195             200             205

30       aag tgc aag atc att cat act gac ata aag ccg gaa aat atc ttg atg    853
         Lys Cys Lys Ile Ile His Thr Asp Ile Lys Pro Glu Asn Ile Leu Met
                     210             215             220

35       tgt gtg gat gat gca tat gtg aga aga atg gca gct gag cct gag tgg    901
         Cys Val Asp Asp Ala Tyr Val Arg Arg Met Ala Ala Glu Pro Glu Trp
                     225             230             235

         cag aaa gca ggt gct cct cct cct tca ggg tct gca gtg agt acg gct    949
40       Gln Lys Ala Gly Ala Pro Pro Pro Ser Gly Ser Ala Val Ser Thr Ala
             240             245             250

         cca cag cag aaa cct ata gga aaa ata tct aaa aac aaa aag aaa aaa    997
         Pro Gln Gln Lys Pro Ile Gly Lys Ile Ser Lys Asn Lys Lys Lys Lys
         255             260             265                 270
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         ctg aaa aag aaa cag aag agg cag gct gag tta ttg gag aag cgc ctg   1045
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         Gln Glu Ile Glu Glu Leu Glu Arg Glu Ala Glu Arg Lys Ile Ile Glu
                     290             295             300

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         Glu Asn Ile Thr Ser Ala Ala Pro Ser Asn Asp Gln Asp Gly Glu Tyr
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         tgc cca gag gtg aaa cta aaa aca aca gga tta gag gag gcg gct gag   1189
60       Cys Pro Glu Val Lys Leu Lys Thr Thr Gly Leu Glu Glu Ala Ala Glu
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         gca gag act gca aag gac aat ggt gaa gct gag gac cag gaa gag aaa   1237
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    Glu Asp Ala Glu Lys Glu Asn Ile Glu Lys Asp Glu Asp Asp Val Asp
                    355             360             365
5

    cag gaa ctt gcg aac ata gac cct acg tgg ata gaa tca cct aaa acc   1333
    Gln Glu Leu Ala Asn Ile Asp Pro Thr Trp Ile Glu Ser Pro Lys Thr
                    370             375             380
10
    aat ggc cat att gag aat ggc cca ttc tca ctg gag cag caa ctg gac   1381
    Asn Gly His Ile Glu Asn Gly Pro Phe Ser Leu Glu Gln Gln Leu Asp
                    385             390             395

    gat gaa gat gat gat gaa gaa gac tgc cca aat cct gag gaa tat aat   1429
15  Asp Glu Asp Asp Asp Glu Glu Asp Cys Pro Asn Pro Glu Glu Tyr Asn
                    400             405             410

    ctt gat gag cca aat gca gaa agt gat tac aca tat agc agc tcc tat   1477
    Leu Asp Glu Pro Asn Ala Glu Ser Asp Tyr Thr Tyr Ser Ser Ser Tyr
20  415             420             425             430

    gaa caa ttc aat ggt gaa ttg cca aat gga cga cat aaa att ccc gag   1525
    Glu Gln Phe Asn Gly Glu Leu Pro Asn Gly Arg His Lys Ile Pro Glu
                    435             440             445
25
    tca cag ttc cca gag ttt tcc acc tcg ttg ttc tct gga tcc tta gaa   1573
    Ser Gln Phe Pro Glu Phe Ser Thr Ser Leu Phe Ser Gly Ser Leu Glu
                    450             455             460

    cct gtg gcc tgc ggc tct gtg ctt tct gag gga tca cca ctt act gag   1621
30  Pro Val Ala Cys Gly Ser Val Leu Ser Glu Gly Ser Pro Leu Thr Glu
                    465             470             475

    caa gag gag agc agt cca tcc cat gac aga agc aga acg gtt tca gcc   1669
35  Gln Glu Glu Ser Ser Pro Ser His Asp Arg Ser Arg Thr Val Ser Ala
                    480             485             490

    tcc agt act ggg gat ttg cca aaa gca aaa acc cgg gca gct gac ttg   1717
    Ser Ser Thr Gly Asp Leu Pro Lys Ala Lys Thr Arg Ala Ala Asp Leu
40  495             500             505             510

    ttg gtg aat ccc ctg gat ccg cgg aat cga gat aaa att aga gta aaa   1765
    Leu Val Asn Pro Leu Asp Pro Arg Asn Arg Asp Lys Ile Arg Val Lys
                    515             520             525
45
    att gct gac ctg gga aat gct tgt tgg gtg cat aaa cac ttc acg gaa   1813
    Ile Ala Asp Leu Gly Asn Ala Cys Trp Val His Lys His Phe Thr Glu
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    gac atc cag acg cgt cag tac cgc tcc ata gag gtt tta ata gga gcg   1861
50  Asp Ile Gln Thr Arg Gln Tyr Arg Ser Ile Glu Val Leu Ile Gly Ala
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    ggg tac agc acc cct gcg gac atc tgg agc acg gcg tgt atg gca ttt   1909
55  Gly Tyr Ser Thr Pro Ala Asp Ile Trp Ser Thr Ala Cys Met Ala Phe
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    gag ctg gca acg gga gat tat ttg ttt gaa cca cat tct ggg gaa gac   1957
    Glu Leu Ala Thr Gly Asp Tyr Leu Phe Glu Pro His Ser Gly Glu Asp
60  575             580             585             590

    tat tcc aga gac gaa gac cac ata gcc cac atc ata gag ctg cta ggc   2005
    Tyr Ser Arg Asp Glu Asp His Ile Ala His Ile Ile Glu Leu Leu Gly
                    595             600             605
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Ser Ile Pro Arg His Phe Ala Leu Ser Gly Lys Tyr Ser Arg Glu Phe
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Phe Asn Arg Arg Gly Glu Leu Arg His Ile Thr Lys Leu Lys Pro Trp
            625                 630                 635

agc ctc ttt gat gta ctt gtg gaa aag tat ggc tgg ccc cat gaa gat    2149
Ser Leu Phe Asp Val Leu Val Glu Lys Tyr Gly Trp Pro His Glu Asp
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gct gca cag ttt aca gat ttc ctg atc ccg atg tta gaa atg gtt cca    2197
Ala Ala Gln Phe Thr Asp Phe Leu Ile Pro Met Leu Glu Met Val Pro
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gaa aaa cga gcc tca gct ggc gaa tgt cgg cat cct tgg ttg aat tct    2245
Glu Lys Arg Ala Ser Ala Gly Glu Cys Arg His Pro Trp Leu Asn Ser
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           65                  70                  75                  80
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                          85                  90                  95
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                       100                 105                 110
          Lys Ser Ala Gln His Tyr Thr Glu Thr Ala Leu Asp Glu Ile Lys Leu
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          Leu Lys Cys Val Arg Glu Ser Asp Pro Ser Asp Pro Asn Lys Asp Met
    35         130                 135                 140
          Val Val Gln Leu Ile Asp Asp Phe Lys Ile Ser Gly Met Asn Gly Ile
          145                 150                 155                 160
          His Val Cys Met Val Phe Glu Val Leu Gly His His Leu Leu Lys Trp
                          165                 170                 175
    40    Ile Ile Lys Ser Asn Tyr Gln Gly Leu Pro Val Arg Cys Val Lys Ser
                       180                 185                 190
          Ile Ile Arg Gln Val Leu Gln Gly Leu Asp Tyr Leu His Ser Lys Cys
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          Lys Ile Ile His Thr Asp Ile Lys Pro Glu Asn Ile Leu Met Cys Val
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          Lys Lys Gln Lys Arg Gln Ala Glu Leu Leu Glu Lys Arg Leu Gln Glu
                  275                 280                 285
          Ile Glu Glu Leu Glu Arg Glu Ala Glu Arg Lys Ile Ile Glu Glu Asn
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          Ile Thr Ser Ala Ala Pro Ser Asn Asp Gln Asp Gly Glu Tyr Cys Pro
          305                 310                 315                 320
          Glu Val Lys Leu Lys Thr Thr Gly Leu Glu Glu Ala Ala Glu Ala Glu
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          Leu Ala Asn Ile Asp Pro Thr Trp Ile Glu Ser Pro Lys Thr Asn Gly
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     Glu Pro Asn Ala Glu Ser Asp Tyr Thr Tyr Ser Ser Ser Tyr Glu Gln
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     Phe Asn Gly Glu Leu Pro Asn Gly Arg His Lys Ile Pro Glu Ser Gln
                         435                    440                    445
 10  Phe Pro Glu Phe Ser Thr Ser Leu Phe Ser Gly Ser Leu Glu Pro Val
                         450                    455                    460
     Ala Cys Gly Ser Val Leu Ser Glu Gly Ser Pro Leu Thr Glu Gln Glu
     465                    470                    475                    480
     Glu Ser Ser Pro Ser His Asp Arg Ser Arg Thr Val Ser Ala Ser Ser
 15                       485                    490                    495
     Thr Gly Asp Leu Pro Lys Ala Lys Thr Arg Ala Ala Asp Leu Leu Val
                         500                    505                    510
     Asn Pro Leu Asp Pro Arg Asn Arg Asp Lys Ile Arg Val Lys Ile Ala
                         515                    520                    525
 20  Asp Leu Gly Asn Ala Cys Trp Val His Lys His Phe Thr Glu Asp Ile
                         530                    535                    540
     Gln Thr Arg Gln Tyr Arg Ser Ile Glu Val Leu Ile Gly Ala Gly Tyr
     545                    550                    555                    560
     Ser Thr Pro Ala Asp Ile Trp Ser Thr Ala Cys Met Ala Phe Glu Leu
 25                       565                    570                    575
     Ala Thr Gly Asp Tyr Leu Phe Glu Pro His Ser Gly Glu Asp Tyr Ser
                         580                    585                    590
     Arg Asp Glu Asp His Ile Ala His Ile Ile Glu Leu Leu Gly Ser Ile
                         595                    600                    605
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     610                    615                    620
     Arg Arg Gly Glu Leu Arg His Ile Thr Lys Leu Lys Pro Trp Ser Leu
     625                    630                    635                    640
     Phe Asp Val Leu Val Glu Lys Tyr Gly Trp Pro His Glu Asp Ala Ala
 35                       645                    650                    655
     Gln Phe Thr Asp Phe Leu Ile Pro Met Leu Glu Met Val Pro Glu Lys
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